Environmental Science

CHLORIDE AS A FUNCTION OF ROAD SALT MEASURED IN SURFACE WATER IN MICHIGAN

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The chloride ion concentration as a function of deicing salt was tested in the Rouge River in Dearborn MI. An increase of 1200% was recorded at a point of influx of parking lot and minimal roadway run off after the first winter snowmelt of 2004. Three samples were taken at different times of the year. The first was taken in November of 2003 before the first winter snowfall. Two more samples were taken on February 20, 2004 after the first winter snow melt and on March 20, 2004 after a second snowmelt. Mohr Titration was used to determine chloride ion concentration. Each titration was performed in triplicate using careful quantitative chemistry techniques**.** The November sample had a concentration of 0.99 mg Cl^-/L. The February sample contained 12.58 mg Cl^-/L, a 1200% increase. The March sample contained 4.06 mg Cl^-/L, a 67% decrease in one month's time.

While these results indicate a dramatic increase in chloride ions in relationship to deicing salt application, the levels were far below known toxic levels for aquatic species. However, chloride concentrations found in groundwater of the Rouge River watershed are significant (Murray, 2004). The rapid decrease in chloride ions from February to March raises questions about what happens to the chloride. Where does it go? Does it go into ground water? More data is needed to determine the seriousness of the impacts of deicing salt on surface water, ground water, and aquatic species.

Due to the dependence on automobile transportation in the Dearborn area, chloride levels were expected to increase dramatically. While the increase was dramatic, the concentration was inconsequential in terms of toxicity to aquatic species. These results were surprising given the high traffic volumes in the area and the wide spread concern about the extensive use of road salt. Before extreme measures are taken on expensive alternatives to road salt, much more data is needed.

Murray, Kent. Personal Interview. 19 Sep. 2004.

Blasius B.J. and Merrit R.W. "Field and laboratory investigations on the effects of road salt (NaCl) on stream macroinvertebrate communities." Environmental Pollution. 12 (2002) : 219-231.